

SEQUENCE LISTING

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Baltzer, Lars
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Dolphin, Gunnar T.

<120> Peptides Based on the Sequence of Human Lactoferrin
and Their Use

<130> 003300-723

<140> US 09/743,107
<141> 2001-01-05

<150> PCT/SE99/01230
<151> 2000-09-29

<150> SE 9802441-7
<151> 1998-07-06

<150> SE 9802562-0
<151> 1998-07-17

<150> SE 9804614-7
<151> 1998-12-29

<160> 100

<170> PatentIn version 2.1

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<223> ACETYLATION

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<222> (1)
<223> Amino acid 1 is Xaa wherein Xaa = Glu or no amino acid.

<220>
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<222> (2)
<223> Amino acid 2 is Xaa wherein Xaa = Ala or no amino acid.

<220>
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<222> (5)
<223> Amino acid 5 is Xaa wherein Xaa = Cys or Ala.

<220>
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 <222> (7)
 <223> Amino acid 7 is Xaa wherein Xaa = Gln or Lys.

 <220>
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 <222> (11)
 <223> Amino acid 11 is Xaa wherein Xaa = Asn or Asp.

 <220>
 <221> PEPTIDE
 <222> (17)...(25)
 <223> Amino acids 17-25 are Xaa wherein Xaa = Gly, Pro, Pro, Val, Ser, Cys, Ile, Lys, Arg

 <220>
 <221> MOD_RES
 <222> (25)
 <223> AMIDATION

 <220>
 <223> Description of Artificial Sequence: of natural or artificial origin, corresponding to modification of the sequence consisting of aa 16-40 in human lactoferrin

 <400> 1

 Xaa Xaa Thr Lys Xaa Phe Xaa Trp Gln Arg Xaa Met Arg Lys Val Arg
 1 5 10 15

 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
 20 25

 <210> 2
 <211> 25
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 <213> Artificial Sequence

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 <223> AMIDATION

 <220>
 <223> Description of Artificial Sequence: of natural or artificial origin, corresponding to a modification of the sequence consisting of amino acids 16-40 in human lactoferrin

 <400> 2
 Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg

1

5

10

15

Gly Pro Pro Val Ser Cys Ile Lys Arg
20 25

<210> 3
<211> 25
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<222> (5)..(22)

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artificial origin, corresponding to a modification
of the sequence consisting of amino acids 16-40 in
human lactoferrin

<400> 3
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10 15

Gly Pro Pro Val Ser Cys Ile Lys Arg
20 25

<210> 4
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
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<220>
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<222> (23)..(23)
<223> AMIDATION

<220>

<223> Description of Artificial Sequence: of natural or artificial origin, corresponding to a modification of the sequence consisting of amino acids 18-40 in human lactoferrin

<400> 4
Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg Gly Pro
1 5 10 15
Pro Val Ser Cys Ile Lys Arg
20

<210> 5

<211> 23

<212> PRT

<213> Artificial Sequence

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<223> ACETYLATION

<220>

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<222> (23)

<223> AMIDATION

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<222> (3)..(20)

<220>

<223> Description of Artificial Sequence: of natural or artificial origin, corresponding to a modification of the sequence consisting of amino acids 18-40 in human lactoferrin

<400> 5

Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg Gly Pro
1 5 10 15

Pro Val Ser Cys Ile Lys Arg
20

<210> 6

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

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<222> (1)

<223> ACETYLATION

<220>
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<222> (14)
<223> AMIDATION

<220>
<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 18-31 in
human lactoferrin

<400> 6
Thr Lys Ala Phe Lys Trp Gln Arg Asp Met Arg Lys Val Arg
1 5 10

<210> 7
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
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<220>
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<223> AMIDATION

<220>
<221> BINDING
<222> (5)..(9)

<220>
<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of aa 18-31 in human
lactoferrin; a lactam is formed between aa 5 and 9

<400> 7
Thr Lys Ala Phe Lys Trp Gln Arg Asp Met Arg Lys Val Arg
1 5 10

<210> 8
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of
natural or artificial origin consisting of the
amino acids in positions 12-31 of the protein

human lactoferrin

<400> 8

Val Ser Gln Pro Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met
1 5 10 15

Arg Lys Val Arg
20

<210> 9

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 12-18 of the protein human lactoferrin

<400> 9

Val Ser Gln Pro Glu Ala Thr
1 5

<210> 10

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 13-19 of the protein human lactoferrin

<400> 10

Ser Gln Pro Glu Ala Thr Lys
1 5

<210> 11

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 14-20 of the protein human lactoferrin

<400> 11

Gln Pro Glu Ala Thr Lys Cys
1 5

<210> 12
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 15-21 of the protein human lactoferrin

<400> 12
Pro Glu Ala Thr Lys Cys Phe
1 5

<210> 13
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 16-22 of the protein human lactoferrin

<400> 13
Glu Ala Thr Lys Cys Phe Gln
1 5

<210> 14
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 17-23 of the protein human lactoferrin

<400> 14
Ala Thr Lys Cys Phe Gln Trp
1 5

<210> 15

<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 18-24 of the protein human lactoferrin

<400> 15
Thr Lys Cys Phe Gln Trp Gln
1 5

<210> 16
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 19-25 of the protein human lactoferrin

<400> 16
Lys Cys Phe Gln Trp Gln Arg
1 5

<210> 17
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 20-26 of the protein human lactoferrin

<400> 17
Cys Phe Gln Trp Gln Arg Asn
1 5

<210> 18
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of

natural or artificial origin consisting of the amino acids in positions 21-27 of the protein human lactoferrin

<400> 18
Phe Gln Trp Gln Arg Asn Met
1 5

<210> 19
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 22-28 of the protein human lactoferrin

<400> 19
Gln Trp Gln Arg Asn Met Arg
1 5

<210> 20
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 23-29 of the protein human lactoferrin

<400> 20
Trp Gln Arg Asn Met Arg Lys
1 5

<210> 21
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 24-30 of the protein human lactoferrin

<400> 21
Gln Arg Asn Met Arg Lys Val

1

5

<210> 22
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 25-31 of the protein human lactoferrin

<400> 22
Arg Asn Met Arg Lys Val Arg
1 5

<210> 23
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 16-23 of the protein human lactoferrin

<400> 23
Glu Ala Thr Lys Cys Phe Gln Trp
1 5

<210> 24
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 16-24 of the protein human lactoferrin

<400> 24
Glu Ala Thr Lys Cys Phe Gln Trp Gln
1 5

<210> 25
<211> 10

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 16-25 of the protein human lactoferrin

<400> 25
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg
1 5 10

<210> 26
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 16-26 of the protein human lactoferrin

<400> 26
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn
1 5 10

<210> 27
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 16-27 of the protein human lactoferrin

<400> 27
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met
1 5 10

<210> 28
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the

amino acids in positions 16-28 of the protein
human lactoferrin

<400> 28
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg
1 5 10

<210> 29
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of
natural or artificial origin consisting of the
amino acids in positions 16-29 of the protein
human lactoferrin

<400> 29
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys
1 5 10

<210> 30
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of
natural or artificial origin consisting of the
amino acids in positions 16-30 of the protein
human lactoferrin

<400> 30
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val
1 5 10 15

<210> 31
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of
natural or artificial origin consisting of the
amino acids in positions 16-31 of the protein
human lactoferrin

<400> 31
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10 15

<210> 32
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 13-31 of the protein human lactoferrin

<400> 32
Ser Gln Pro Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg
1 5 10 15
Lys Val Arg

<210> 33
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 14-31 of the protein human lactoferrin

<400> 33
Gln Pro Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys
1 5 10 15
Val Arg

<210> 34
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 15-31 of the protein human lactoferrin

<400> 34
Pro Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val
1 5 10 15

Arg

<210> 35
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 17-31 of the protein human lactoferrin!

<400> 35
Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10 15

<210> 36
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 18-31 of the protein human lactoferrin

<400> 36
Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 37
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 19-31 of the protein human lactoferrin

<400> 37
Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 38

<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 20-31 of the protein human lactoferrin

<400> 38
Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 39
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 21-31 of the protein human lactoferrin

<400> 39
Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 40
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 22-31 of the protein human lactoferrin

<400> 40
Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 41
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of

natural or artificial origin consisting of the amino acids in positions 23-31 of the protein human lactoferrin

<400> 41
Trp Gln Arg Asn Met Arg Lys Val Arg
1 5

<210> 42
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide of natural or artificial origin consisting of the amino acids in positions 24-31 of the protein human lactoferrin

<400> 42
Gln Arg Asn Met Arg Lys Val Arg
1 5

<210> 43
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> PEPTIDE
<222> (2)..(10)
<223> Amino acids 2, 4, 6 and 10 are Xaa wherein Xaa = Gln, Lys, Asp, Asn or Val.

<220>
<223> Description of Artificial Sequence: of natural or artificial origin, corresponding to a modification of the sequence consisting of amino acids 21-31 in human lactoferrin

<400> 43
Phe Xaa Trp Xaa Arg Xaa Met Arg Lys Xaa Arg
1 5 10

<210> 44
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or

artificial origin, corresponding to the sequence
consisting of amino acids 21-31 in human
lactoferrin

<400> 44
Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 45
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 45
Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 46
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 46
Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 47
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 47
Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg

1

5

10

<210> 48
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 48
Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 49
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been modified

<400> 49
Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 50
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 50
Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 51
<211> 14

<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 51

Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 52

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 18-31 in
human lactoferrin

<400> 52

Thr Lys Ala Phe Lys Trp Gln Arg Asp Met Arg Lys Val Arg
1 5 10

<210> 53

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 18-31 in
human lactoferrin

<220>

<221> MOD_RES

<222> (1)

<223> ACETYLATION

<220>

<221> MOD_RES

<222> (14)

<223> AMIDATION

<400> 53

Thr Lys Ala Phe Lys Trp Gln Arg Glu Met Arg Lys Val Arg
1 5 10

<210> 54
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of aa 18-31 in human
lactoferrin; a lactam is formed between aa 5 and 9

<220>
<221> BINDING
<222> (5)..(9)
<223> LACTAM

<400> 54
Thr Lys Ala Phe Lys Trp Gln Arg Asp Met Arg Lys Val Arg
1 5 10

<210> 55
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of aa 18-31 in human
lactoferrin; a lactam is formed between aa 5 and 9

<220>
<221> MOD_RES
<222> (1)
<223> ACETYLATION

<220>
<221> MOD_RES
<222> (14)
<223> AMIDATION

<220>
<221> BINDING
<222> (5)..(9)
<223> LACTAM

<400> 55
Thr Lys Ala Phe Lys Trp Gln Arg Glu Met Arg Lys Val Arg
1 5 10

<210> 56
<211> 14

<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 18-31 in
human lactoferrin

<400> 56

Thr Lys Lys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 57

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 18-31 in
human lactoferrin

<220>

<221> MOD_RES

<222> (1)

<223> ACETYLATION

<220>

<221> MOD_RES

<222> (14)

<223> AMIDATION

<400> 57

Thr Lys Lys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 58

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 18-31 in
human lactoferrin

<400> 58

Thr Lys Lys Phe Gln Trp Asp Arg Lys Met Arg Lys Asp Arg
1 5 10

<210> 59
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 18-31 in
human lactoferrin

<220>
<221> MOD_RES
<222> (1)
<223> ACETYLATION

<220>
<221> MOD_RES
<222> (14)
<223> AMIDATION

<400> 59
Thr Lys Lys Phe Gln Trp Asp Arg Lys Met Arg Lys Asp Arg
1 5 10

<210> 60
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or artificial
origin, corresp. to a modification of the seq. consisting
of aa 18-31 in human lactoferrin; lactams formed between aa
3 and 7, and 9 and 13

<220>
<221> BINDING
<222> (3)..(7)
<223> LACTAM

<220>
<221> BINDING
<222> (9)..(13)
<223> LACTAM

<400> 60
Thr Lys Lys Phe Gln Trp Asp Arg Lys Met Arg Lys Asp Arg
1 5 10

<210> 61
<211> 14

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or artificial origin, corresp. to a modification of the seq. consisting of aa 18-31 in human lactoferrin; lactams formed between aa 3 and 7, and 9 and 13

<220>
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<222> (1)
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<220>
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<222> (14)
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<220>
<221> BINDING
<222> (3)..(7)
<223> LACTAM

<220>
<221> BINDING
<222> (9)..(13)
<223> LACTAM

<400> 61
Thr Lys Lys Phe Gln Trp Asp Arg Lys Met Arg Lys Asp Arg
1 5 10

<210> 62
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or artificial origin, corresponding to the sequence consisting of amino acids 17-31 in human lactoferrin

<400> 62
Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10 15

<210> 63
<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 17-31 in
human lactoferrin

<220>

<221> MOD_RES

<222> (1)

<223> ACETYLATION

<220>

<221> MOD_RES

<222> (15)

<223> AMIDATION

<400> 63

Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10 15

<210> 64

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to the sequence
consisting of amino acids 16-31 in human
lactoferrin

<400> 64

Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10 15

<210> 65

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 16-31 in
human lactoferrin

<220>

<221> MOD_RES

<222> (1)

<223> ACETYLATION

<220>

<221> MOD_RES

<222> (16)
<223> AMIDATION

<400> 65
Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10 15

<210> 66
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to the sequence
consisting of amino acids 15-31 in human
lactoferrin

<400> 66
Pro Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val
1 5 10 15

Arg

<210> 67
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: of natural or
artificial origin, corresponding to a modification
of the sequence consisting of amino acids 15-31 in
human lactoferrin

<220>
<221> MOD_RES
<222> (1)
<223> ACETYLATION

<220>
<221> MOD_RES
<222> (17)
<223> AMIDATION

<400> 67
Pro Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val
1 5 10 15

Arg

<210> 68
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 68
Ala Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 69
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 69
Cys Ala Gln Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 70
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 70
Cys Phe Ala Trp Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 71
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 71

Cys Phe Gln Ala Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 72

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 72

Cys Phe Gln Trp Ala Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 73

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been modified

<400> 73

Cys Phe Gln Trp Gln Ala Asn Met Arg Lys Val Arg
1 5 10

<210> 74

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 74
Cys Phe Gln Trp Gln Arg Ala Met Arg Lys Val Arg
1 5 10

<210> 75
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 75
Cys Phe Gln Trp Gln Arg Asn Ala Arg Lys Val Arg
1 5 10

<210> 76
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 76
Cys Phe Gln Trp Gln Arg Asn Met Ala Lys Val Arg
1 5 10

<210> 77
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 77
Cys Phe Gln Trp Gln Arg Asn Met Arg Ala Val Arg
1 5 10

<210> 78
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 78
Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Ala Arg
1 5 10

<210> 79
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 79
Cys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Ala
1 5 10

<210> 80
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 80
Cys Phe Gln Leu Gln Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 81
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or artificial origin, corresponding to the sequence consisting of aa 20-31 in human lactoferrin wherein one aa has been substituted

<400> 81
Cys Phe Gln Trp Gln Lys Asn Met Arg Lys Val Arg
1 5 10

<210> 82
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or artificial origin, corresponding to the sequence consisting of aa 20-31 in human lactoferrin wherein one aa has been substituted

<400> 82
Cys Phe Gln Trp Gln Arg Asn Leu Arg Lys Val Arg
1 5 10

<210> 83
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or artificial origin, corresponding to the sequence consisting of aa 20-31 in human lactoferrin wherein one aa has been substituted

<400> 83
Cys Phe Gln Trp Gln Arg Asn Met Lys Lys Val Arg
1 5 10

<210> 84
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or artificial origin, corresponding to the sequence consisting of aa 20-31 in human lactoferrin wherein one aa has been substituted

<400> 84

Cys Phe Gln Trp Glu Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 85

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 85

Cys Phe Gln Trp Gln Glu Asn Met Arg Lys Val Arg
1 5 10

<210> 86

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<400> 86

Cys Phe Gln Trp Gln Arg Glu Met Arg Lys Val Arg
1 5 10

<210> 87

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<220>

<221> MISC_FEATURE

<222> (5)

<223> Amino acid 5 is Xaa wherein Xaa = Orn.

<400> 87

Cys Phe Gln Trp Xaa Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 88
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<220>
<221> MISC_FEATURE
<222> (5)
<223> Amino acid 5 is Xaa wherein Xaa = Nle.

<400> 88
Cys Phe Gln Trp Xaa Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 89
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein one aa has been substituted

<220>
<221> MISC_FEATURE
<222> (7)
<223> Amino acid 7 is Xaa wherein Xaa = Orn.

<400> 89
Cys Phe Gln Trp Gln Arg Xaa Met Arg Lys Val Arg
1 5 10

<210> 90
<211> 12
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:of natural or artificial origin, corresponding to the sequence consisting of aa 20-31 in human lactoferrin wherein one aa has been substituted

<220>
<221> MISC_FEATURE
<222> (7)
<223> Amino acid 7 is Xaa wherein Xaa = Nle.

<400> 90
Cys Phe Gln Trp Gln Arg Xaa Met Arg Lys Val Arg
1 5 10

<210> 91
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or artificial origin, corresponding to the sequence consisting of aa 20-31 in human lactoferrin wherein one aa has been substituted

<400> 91
Cys Phe Gln Trp Lys Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 92
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or artificial origin, corresp. to a modification of the sequence consisting of aa 18-31 in human lactoferrin; a lactam is formed between aa 5 and 9

<220>
<221> BINDING
<222> (5)..(9)
<223> LACTAM

<400> 92
Cys Phe Gln Trp Lys Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 93

<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein some aa have been substituted

<400> 93
Cys Phe Gln Trp Lys Arg Ala Met Arg Lys Val Arg
1 5 10

<210> 94
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein some aa have been substituted

<400> 94
Cys Phe Ala Trp Lys Arg Asn Met Arg Lys Val Arg
1 5 10

<210> 95
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or
artificial origin, corresponding to the sequence
consisting of aa 20-31 in human lactoferrin
wherein some aa have been substituted

<400> 95
Cys Phe Ala Trp Gln Arg Ala Met Arg Lys Val Arg
1 5 10

<210> 96
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:of natural or

artificial origin, corresponding to the sequence
 consisting of aa 20-31 in human lactoferrin
 wherein some aa have been substituted

<400> 96
 Cys Phe Gln Leu Lys Lys Asn Met Lys Lys Val Arg
 1 5 10

<210> 97
 <211> 12
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:of natural or
 artificial origin, corresp. to a modification of
 the sequence consisting of aa 18-31 in human
 lactoferrin; a lactam is formed between aa 5 and 9

<220>
 <221> BINDING
 <222> (5)..(9)
 <223> LACTAM

<400> 97
 Cys Phe Ala Leu Lys Lys Ala Met Lys Lys Val Arg
 1 5 10

<210> 98
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:of natural or
 artificial origin, corresp. to a modification of
 the sequence consisting of aa 18-31 in human
 lactoferrin; a lactam is formed between aa 5 and 9

<220>
 <221> BINDING
 <222> (5)..(9)
 <223> LACTAM

<400> 98
 Thr Lys Lys Phe Gln Trp Gln Arg Asn Met Arg Lys Val Arg
 1 5 10

<210> 99
 <211> 12
 <212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: of natural or artificial origin, corresp. to a modification of the sequence consisting of aa 18-31 in human lactoferrin; a lactam is formed between aa 5 and 9

<220>

<221> PEPTIDE

<222> (3)

<223> Amino acid 3 is Xaa wherein Xaa = Gln or Ala.

<220>

<221> PEPTIDE

<222> (4)

<223> Amino acid 4 is Xaa wherein Xaa = Trp or Leu.

<220>

<221> PEPTIDE

<222> (5)

<223> Amino acid 5 is Xaa wherein Xaa = Gln, Lys, Orn, Ala or Nle.

<220>

<221> PEPTIDE

<222> (6)

<223> Amino acid 6 is Xaa wherein Xaa = Arg, Lys or Ala.

<220>

<221> PEPTIDE

<222> (7)

<223> Amino acid 7 is Xaa wherein Xaa = Asn, Orn, Ala or Nle.

<220>

<221> PEPTIDE

<222> (8)

<223> Amino acid 8 is Xaa wherein Xaa = Met or Leu.

<220>

<221> PEPTIDE

<222> (9)

<223> Amino acid 9 is Xaa wherein Xaa = Arg or Lys.

<220>

<221> BINDING

<222> (5)..(9)

<223> LACTAM

<400> 99

Cys Phe Xaa Xaa Xaa Xaa Xaa Xaa Lys Val Arg
1 5 10

<210> 100

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:a fragment of
human lactoferrin consisting of the amino acids in
positions 12-40

<400> 100

Val Ser Gln Pro Glu Ala Thr Lys Cys Phe Gln Trp Gln Arg Asn Met
1 5 10 15

Arg Lys Val Arg Gly Pro Pro Val Ser Cys Ile Lys Arg
20 25